TANGIBLE RESULT #9

Be a Good Steward of Our Environment

MDOT will be accountable to our customers for the wise use of limited resources and our impacts on the environment when designing, building, operating and maintaining a transportation system.

RESULT DRIVER:
Dorothy Morrison
The Secretary's Office (TSO)

TANGIBLE RESULT DRIVER:
Dorothy Morrison
The Secretary's Office (TSO)

PERFORMANCE MEASURE DRIVER:
Sonal Ram
State Highway Administration (SHA)

PURPOSE OF MEASURE:
To evaluate the health of the Chesapeake Bay by measuring how well MDOT is achieving compliance with impervious surface restoration as required by the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer system (MS4) permit.

FREQUENCY:
Annually (in October)

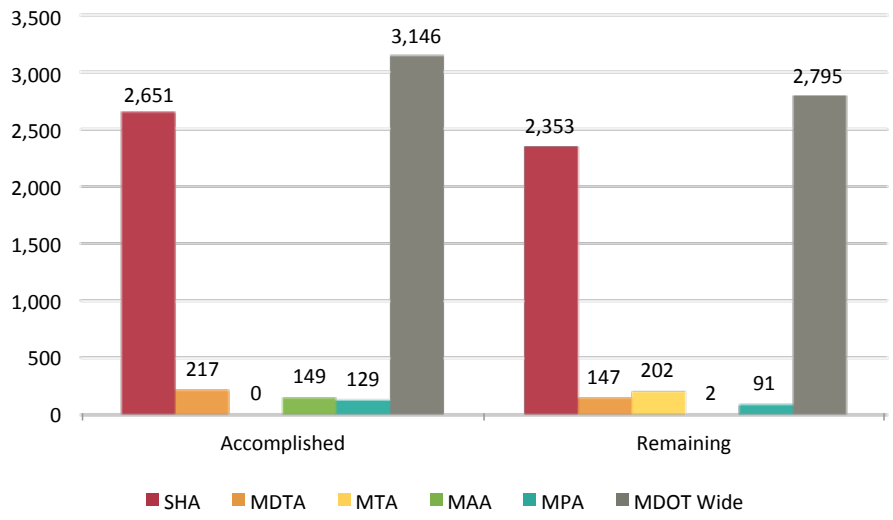
DATA COLLECTION METHODOLOGY:
MDOT is tracking all Bay restoration projects and impervious surface treatment associated with those projects to determine overall progress toward the 20 percent goal during their five-year permit term.

NATIONAL BENCHMARK:
N/A

PERFORMANCE MEASURE 9.1
Water Quality Treatment to Protect and Restore the Chesapeake Bay

Maryland's environmental and economic success is tied to the health of the Chesapeake Bay. The fastest growing source of Bay pollution is stormwater runoff, intensified by impervious surfaces like pavement, roads, rooftops and parking lots. Prior to the 1980s, the majority of infrastructure development in Maryland was built without stormwater controls. Under the federal and state mandated stormwater permit, acreage equivalent to 20 percent of MDOT's impervious surface that has not been previously treated by stormwater management controls will be treated through a variety of restoration efforts. MDOT will track incremental progress towards the 20 percent goal to be achieved within the five-year permit term to ensure progress towards a cleaner Bay and healthier State of Maryland.

Impervious Restoration



Be a Good Steward of Our Environment

TANGIBLE RESULT DRIVER:
Dorothy Morrison
The Secretary's Office (TSO)

PERFORMANCE MEASURE DRIVER:
Paul Truntich Jr.
Maryland Transportation Authority (MDTA)

PURPOSE OF MEASURE:
To track overall fuel economy of fleet vehicles and ensure better air quality through the use of state vehicles. It is important to track miles per gallon in a meaningful manner to ensure that State vehicles are fuel efficient and not detrimental to our State air quality. Fuel economy data will be used to evaluate driving patterns as well as when the procurement of new fleet vehicles is considered

FREQUENCY:
Annually (April)

DATA COLLECTION METHODOLOGY:
Fleet MPG data will be obtained from the State of Maryland's fuel service vendor.

NATIONAL BENCHMARK:
N/A

PERFORMANCE MEASURE 9.2A
Fuel Efficiency: Miles Per Gallon

Currently, there is no uniform approach to evaluating miles per gallon (MPG) of MDOT fleet vehicles. Mansfield Oil Company (statewide fueling vendor) has been contacted regarding developing a means of tracking this data. While reducing fuel consumption through improved fleet fuel economy is a benefit to tracking this data (cost savings and resource conservation), it does not come without significant limitations. Incorrect vehicle mileage entry at the time of vehicle refueling will skew all resulting MPG data for the vehicle in question. Additionally, police vehicles, snow fighting equipment, courtesy patrol vehicles and maintenance of traffic equipment, depending on their situation, can spend significant amounts of time idling which also taints MPG data. Finally, traditional heavy equipment does not always refuel at a dispenser, but are refueled by intermediate methods, so in these instances Mansfield Oil would have no means of tracking and recording MPG. While monitoring fuel efficiency via tracking MPG data appears to be a sound approach, inclusion of all fleet vehicles in such a tracking regime is not practical at this time. Therefore, at the outset of this performance measure, only light-duty vehicles, or a segment thereof, will be measured. As light-duty vehicles comprise approximately 48% of MDOT's total fleet, this data should be beneficial in evaluating driving patterns as well as developing measures to increase overall fuel mileage in this segment me of MDOT's fleet.

TANGIBLE RESULT DRIVER:
Dorothy Morrison
The Secretary's Office (TSO)

PERFORMANCE MEASURE DRIVER:
Paul Truntich Jr.
Maryland Transportation Authority

PURPOSE OF MEASURE:
To track overall fuel consumption of fleet vehicles as well as fixed-equipment in an effort to use less of our resources with State vehicles and equipment. Consumption patterns will be evaluated for improving fuel efficiency and shifting towards use of renewable fuels.

FREQUENCY:
Annually (in October)

DATA COLLECTION METHODOLOGY:
Fleet vehicle data will be obtained from the State of Maryland's fuel service vendor. Fixed-equipment data will be supplied from Fleet and Facility Managers at the TBUs.

NATIONAL BENCHMARK:
N/A

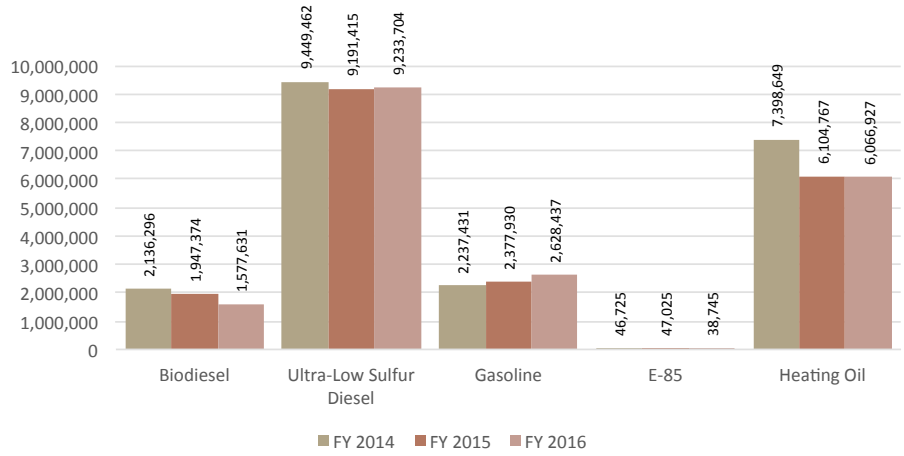
PERFORMANCE MEASURE 9.2B
Fuel Efficiency: Total Gallons Consumed

Analyzing fuel consumption patterns enables Fleet and Facility Managers to budget more effectively and use resources more efficiently. This data also will be beneficial as fleet acquisition purchases are considered and facility heating upgrades are considered. Additionally, identifying opportunities for reducing fuel consumption not only benefits the environment via resource conservation and reduced emissions, but also results in true cost-savings through reduced fuel costs.

Fiscal Years 2014 through 2016 indicate relatively constant ultra-low sulfur diesel consumption with the MTA contributing to the majority of fuel consumed via its bus fleet and MARC trains.

Heating oil consumption experienced a significant reduction during the reporting period. While consumption is weather influenced, the MPA converted from oil-fired to natural gas HVAC systems at several facilities which contributed to the reduction. Furthermore, MDTA and MTA have similar construction projects either fully underway or within the design process. Biodiesel and gasoline experienced nearly identical reductions and increases, respectively. This is attributed to SHA's transitioning of its light and medium-duty fleet from diesel to gasoline for vehicle maintenance issues.

Total Gallons of Fuel Consumed



TANGIBLE RESULT DRIVER:
Dorothy Morrison
The Secretary's Office (TSO)

PERFORMANCE MEASURE DRIVER:
Hargurpreet Singh, P.E.
Motor Vehicle Administration (MVA)

PURPOSE OF MEASURE:
To track the percentage of waste diverted from the landfill or incineration through recycling to minimize negative impacts on the environment.

FREQUENCY:
Annually (in April)

DATA COLLECTION METHODOLOGY:
Maryland Department of the Environment All State Agency Recycling (All StAR) reporting.

NATIONAL BENCHMARK:
Virginia – 35 percent by 2010

Washington DC – 45 percent

Florida – 75 percent by 2020 (recycle rate in 2014 was 50 percent)

California – 75 percent by 2020 (4 cities achieved highest reporting recycling rates in 2014 with 74.85 percent average)

PERFORMANCE MEASURE 9.3
Percent of Maryland Recycling Act Materials Recycled

Activities and operations within MDOT are subject to various Federal, State, and Local environmental rules and regulations. Compliance to these various environmental rules and regulations helps minimize negative impact on the environment.

In 1988, the Maryland Recycling Act (MRA) authorized Maryland Department of the Environment to reduce the disposal of solid waste in Maryland through management, education and regulation.

Recycling Goals were set at:

- 20 percent - For Jurisdictions with populations greater than 150,000; and
- 15 percent - For Jurisdictions with populations less than 150,000;
- But in no case will the recycling rate be less than 10 percent.

In 2012, Maryland State Legislature set new Statewide Recycling Goals of:

- 30 percent in 2014
- 40 percent in 2015

MDOT recycles and cares about recycling because of the following benefits:

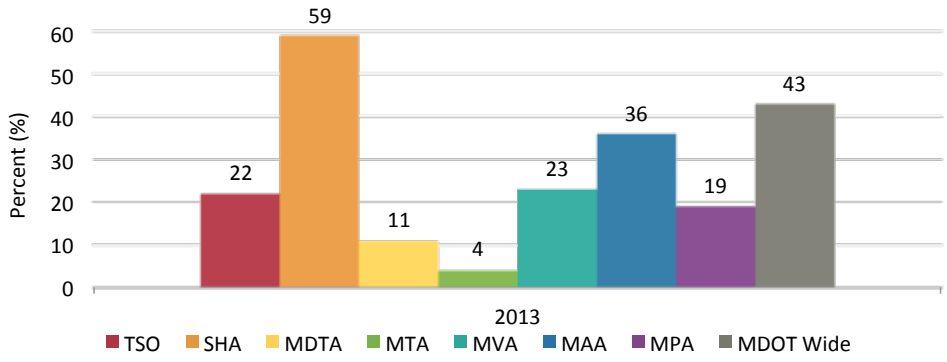
- Conserves Resources
  - When we recycle, used materials are converted into new products, reducing the need to consume natural resources.
- Saves Energy
  - Using recycled materials in the manufacturing process uses considerably less energy than that required for producing new products from raw materials.
- Helps Protect the Environment
  - Recycling reduces the need for extracting, refining and processing raw materials all of which create substantial air and water pollution.
  - As recycling saves energy, it also reduces greenhouse gas emissions, which helps to tackle climate change.
- Reduces Landfill

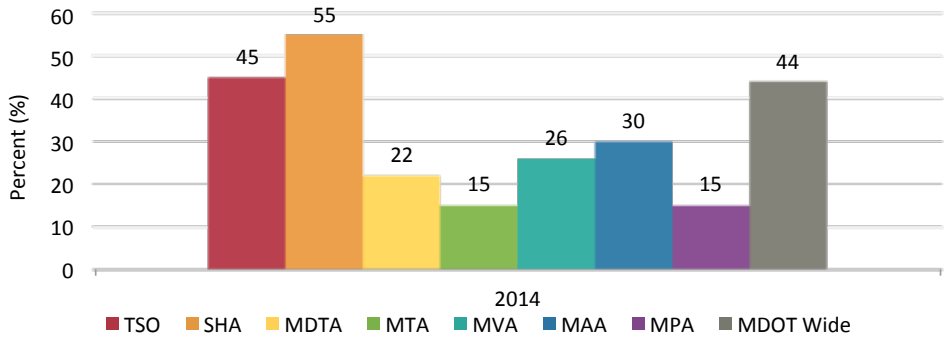
Recycling ensures recyclable materials are reprocessed into new products, and as a result the amount of rubbish sent to landfill sites reduces.

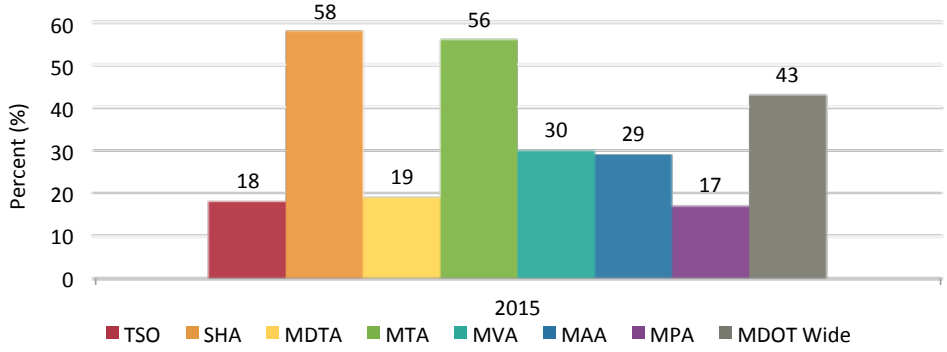
PERFORMANCE MEASURE 9.3

Percent of Maryland Recycling Act Materials Recycled

Percent Waste Recycled by Business Unit







TANGIBLE RESULT DRIVER:
Dorothy Morrison
The Secretary's Office (TSO)

PERFORMANCE MEASURE DRIVER:
Barbara McMahon
Maryland Port Administration (MPA)

PURPOSE OF MEASURE:
To reduce TBU impact on solid waste landfill through recycling/ reuse of steel, asphalt and concrete.

FREQUENCY:
Annually (in April)

DATA COLLECTION METHODOLOGY:
The data collection methodology will include disposal weights (via bill of ladings) by Business Unit's Facility Maintenance and Engineering Departments. The data are and/or should be reported on the annual Non-Maryland Recycling Act Report

NATIONAL BENCHMARK:
N/A

PERFORMANCE MEASURE 9.4

Recycled/Reused Materials from Maintenance Activities and Construction/ Demolition Projects

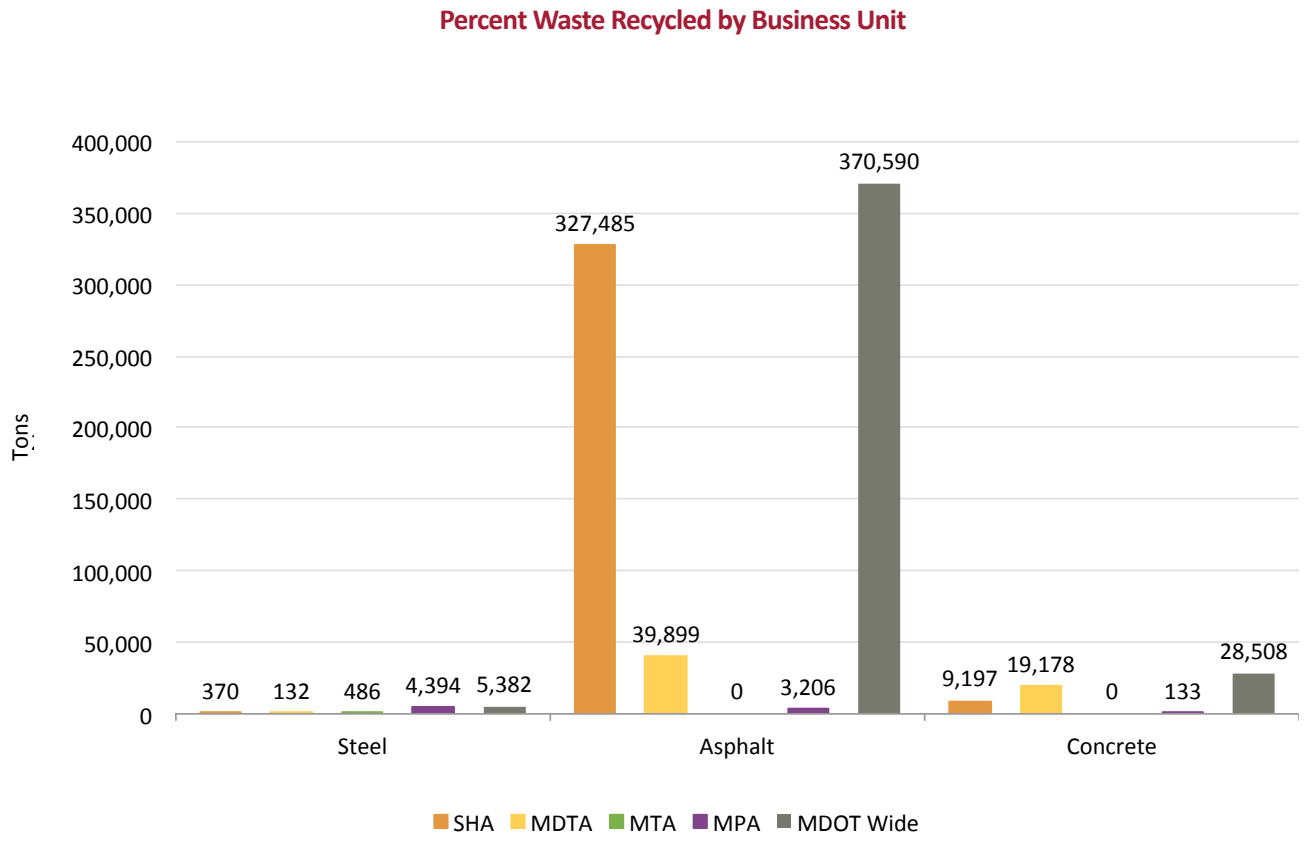
MDOT is committed to reducing its impact on solid waste, non-hazardous landfills, potentially resulting in reduction of the number of waste disposal facilities in Maryland as stated in the Maryland Department of the Environment's "Zero Waste" Action Plan. If not already in place, the TBUs will establish policy and procedures to recycle and/or reuse their solid waste: steel, asphalt and concrete. These materials are generated during maintenance/repair activities and capital construction/demolition projects. In both instances of generation of these materials, the policy/ procedure should require the TBUs to collect, weigh and recycle; this will generally result in a payment by a recycler to the TBU, in particular steel. The benefits of recycling/reusing these materials include saving energy and natural resources, preserving the capacity of landfills, reducing waste disposal costs, generating revenue for materials and reducing pollutants generated by landfill process.

There are several possible barriers to success, including the following:

- Recognizing that there will be variability among reporting periods and TBUs. Some may have more maintenance and construction/demolition activities than others.
- Establishing data collection mechanisms in each TBU.
- Developing contractual language that requires contractors to segregate, collect, weigh and recycle these materials.
- Ensuring commitment to this goal and its positive impact on the environment, including training employees and contractors.

PERFORMANCE MEASURE 9.4

Recycled/Reused Materials from Maintenance Activities and Construction/ Demolition Projects



TANGIBLE RESULT DRIVER:
Dorothy Morrison
The Secretary's Office (TSO)

PERFORMANCE MEASURE DRIVER:
Robin Bowie
Maryland Aviation Administration (MAA)

PURPOSE OF MEASURE:
To provide consistent monitoring of TBU compliance with environmental requirements and to ensure MDOT meets Federal, state and local environmental regulations.

FREQUENCY:
Annually (in October)

DATA COLLECTION METHODOLOGY:
Enterprise Environmental Information Management System

NATIONAL BENCHMARK:
International Organization for Standardization (ISO) 14001 ISO has a requirement to "evaluate compliance." The standard does not dictate the frequency but states that an organization's "process needs to determine how often you will check each level of compliance."

PERFORMANCE MEASURE 9.5
Compliance with Environmental Requirements

MDOT activities and operations are subject to various Federal, state, and local environmental regulations. Adherence to the environmental requirements minimizes the potential for activities and operations of transportation facilities to adversely impact the environment and the surrounding communities. Compliance with the environmental requirements that govern MDOT activities and operations is key to being a good steward of the environment. Conducting audits is an effective mechanism for monitoring compliance with environmental requirements. Tracking audits and reporting audit results further demonstrates MDOT's commitment of environmental stewardship, which benefits not only the natural environment but also the citizens of Maryland.

MDOT participated in third party audits as part of an agreement with Environmental Protection Agency (EPA) Region 3. As noted in the data, the frequency of audits conducted since the EPA third party audits have varied for each TBU. This initial round of information collection and review also revealed a difference in the type (internal vs. external) of audits that have been conducted by each TBU. Several TBUs are in the process of formalizing audit processes and/or procuring audit contracts. Strategies put into place to bring the TBU's into a more consistent reporting method include standardizing audit activities across MDOT, developing a comprehensive environmental compliance audit checklist for use during audits and developing an enterprise environmental management system (EEIMS) module for reporting audit information. On an annual basis, MDOT will share audit results.

Be a Good Steward of Our Environment

TANGIBLE RESULT DRIVER:
Dorothy Morrison
The Secretary's Office (TSO)

PERFORMANCE MEASURE DRIVER:
Robert Frazier
Maryland Transit Administration (MTA)

PURPOSE OF MEASURE:
To make improvements beyond the environmental permit requirements (air quality and storm water Industrial Discharge permits 12-SW) enhances the positive environmental impacts on land and water resources of MDOT's surrounding communities and neighborhoods.

FREQUENCY:
Quarterly

DATA COLLECTION METHODOLOGY:
Quarterly visual monitoring. Age and fuel type of air emissions sources.

NATIONAL BENCHMARK:
Best for the World Impact Assessment, a comprehensive assessment of an organization's impact on its workers, community, and the environment.

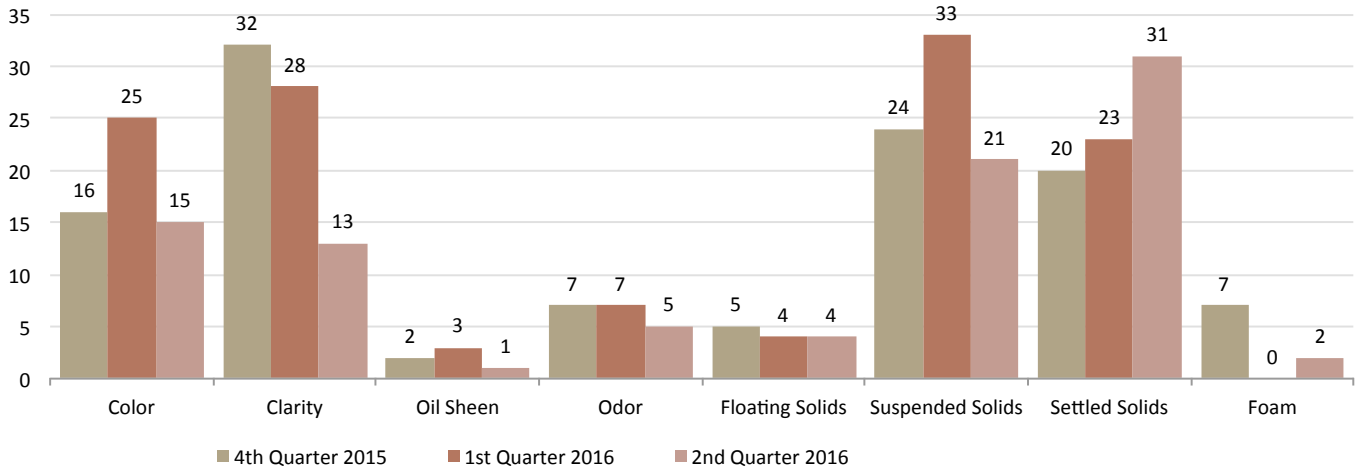
PERFORMANCE MEASURE 9.6
Environmental Impacts and Community Enhancements

The presence of MDOT facilities in communities throughout Maryland has an impact on the environment. MDOT industrial facilities operating under a 12-SW storm water discharge permit perform quarterly visual monitoring of storm water quality leaving those properties. Eight parameters are viewed and recorded per quarter per facility outfall. Variations from the parameters can impact the watersheds in which the permit is located. Data from the monitoring indicates facilities requiring improvements to best management practices such as increased lot sweeping and installation of bio-swales improving water quality.

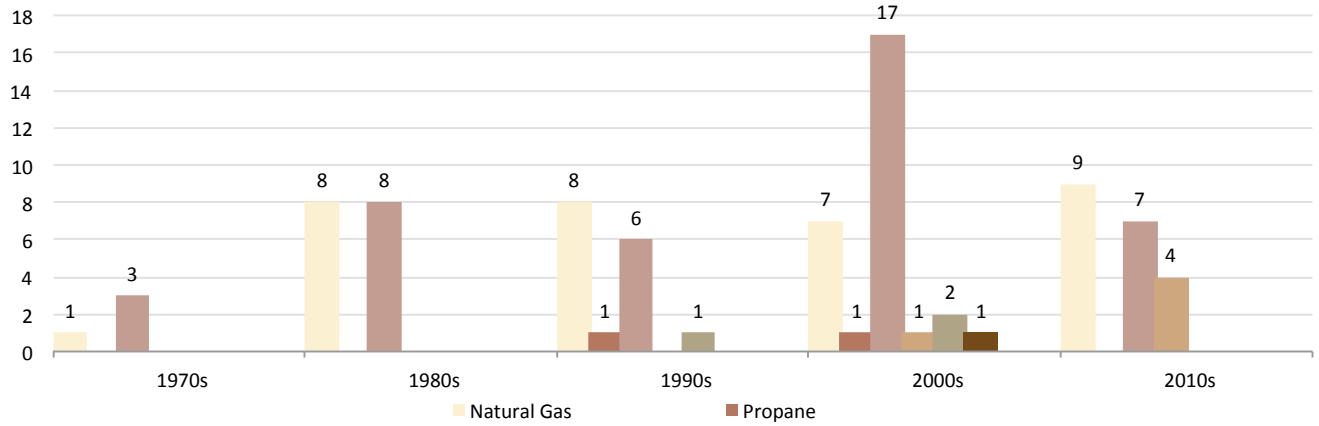
MDOT permitted air sources operate in communities within permit parameters. Air sources include paint booths, boilers, generators and petroleum storage tanks. This equipment varies widely in age and operating efficiencies. Identifying and replacing/retrofitting older, less efficient pieces of equipment with new and more efficient pieces of equipment will have a positive effect on the community.

PERFORMANCE MEASURE 9.6
Environmental Impacts and Community Enhancements

Environmental Impacts and Community Enhancements: Stormwater



Environmental Impacts and Community Enhancements: Air



TANGIBLE RESULT DRIVER:
Dorothy Morrison
The Secretary's Office (TSO)

PERFORMANCE MEASURE DRIVER:
Laura Rogers
The Secretary's Office (TSO)

PURPOSE OF MEASURE:
To reduce our consumption of energy through efficiency measures and use of renewable energy sources.

FREQUENCY:
Quarterly

DATA COLLECTION METHODOLOGY:
Data for all of MDOT's electric, natural gas, propane, oil #2, steam, and chilled water usage collected on EnergyCAP Online will be evaluated. Data for energy efficiency measures and renewable energy sources utilized by MDOT will be collected from the TBU Energy Manager. Emissions calculated based on the amount and type of energy used.

NATIONAL BENCHMARK:
Renewable Energy:

Federal agencies - 30% by 2015

Delaware - 25% by 2025, solar 3.5% by 2025

West Virginia - 25% by 2025

New Jersey - 22.5% by 2021

Washington DC - 20% by 2020, 50% by 2032, solar 2.5% by 2023

PERFORMANCE MEASURE 9.7
Energy Consumption

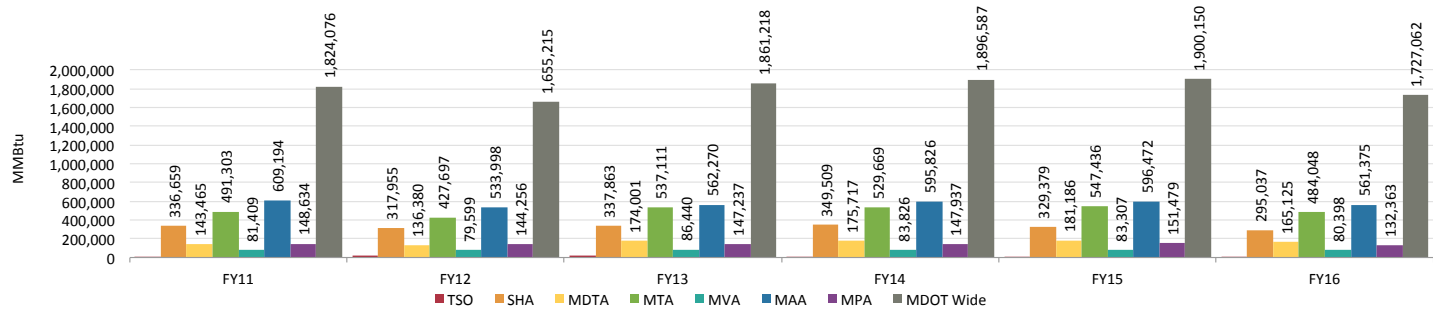
Reducing our energy consumption through energy efficiency and use of renewable energy sources saves Maryland money and reduces GHG emissions. Measuring and analyzing energy consumption enables Energy Managers to budget more effectively and use resources more efficiently. MDOT uses approximately 1,600,000-1,900,000 million British Thermal Units (MMBtu) of energy, spends approximately $30,000,000-$47,000,000, and generates approximately 270,000 metric tons of greenhouse gases (GHG) annually.

MDOT's buildings consume the majority of energy. Many energy efficiency measures have already been implemented at MDOT, including lighting retrofits, replacement of old equipment with energy efficient equipment, and installation of building automation systems. These measures have attained high rates of return on investment.

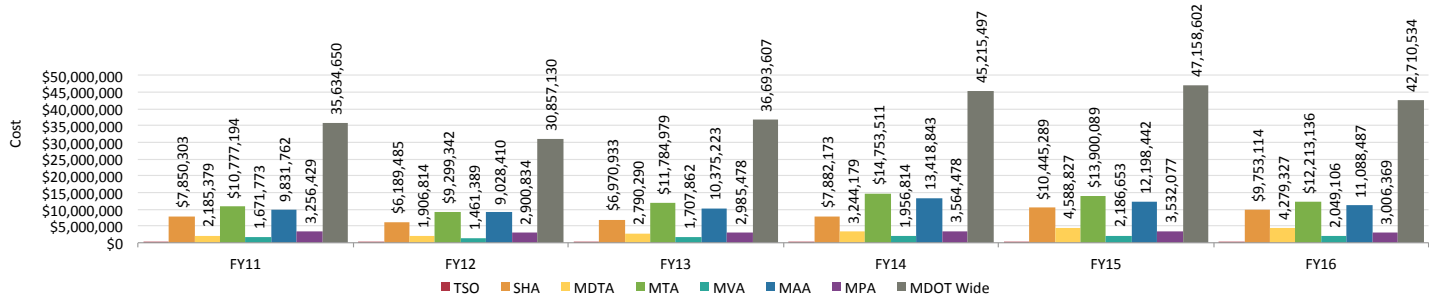
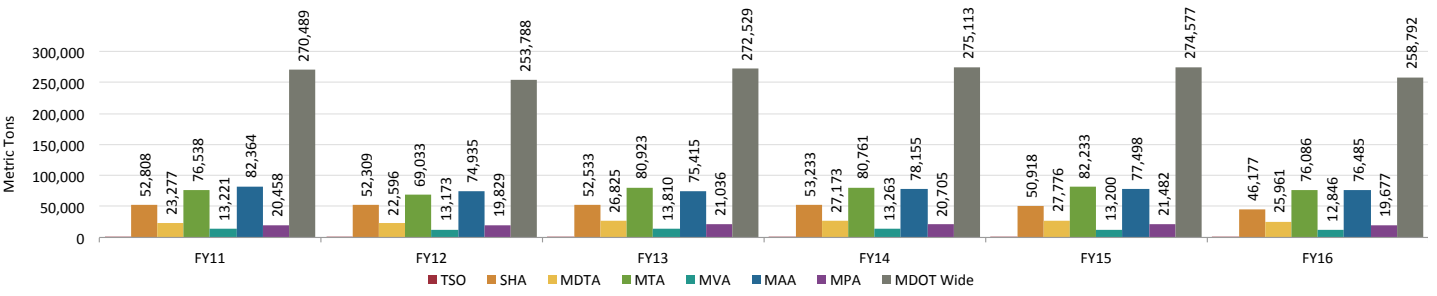
MDOT owns and manages considerable real estate, a portion of which could support renewable energy systems without hindering its core functionality. By increasing installation and use of renewable energy, MDOT can generate revenue, save taxpayers money, and reduce harmful air emissions while also helping Maryland meet its clean energy and GHG reduction goals. As of August 2016, MDOT has installed solar, wind, and geothermal energy systems at MAA, MDTA, MPA, MTA, and SHA facilities. These systems generate approximately 218,000 kilowatt hours/year, saving about $265,000 and 153 metric tons of carbon dioxide annually.

PERFORMANCE MEASURE 9.7
Energy Consumption

Total Energy Use



Total Energy Cost



Greenhouse Gas Emissions